TELECOMMUNICATION NETWORK THAT PROVIDES

CALLER-ENTERED INFORMATION TO MULTIPLE CALL DESTINATIONS

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RELATED APPLICATIONS

5   Not applicable

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable

10   MICROFICHE APPENDIX

Not applicable

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

15   The invention is related to the field of communications, and in particular, to

telecommunication networks that provide caller-entered information to call destinations.

2. DESCRIPTION OF THE PRIOR ART

In a telecommunication network, a switching system routes calls from callers to

destinations. To determine how to route these calls, the switching systems may transfer

20   queries to a Service Control Point (SCP). The SCP translates dialed telephone numbers

into routing instructions, and responds to the switching system with the routing

instructions. For example, the SCP might translate an 800 number into a routing

instruction that indicates a switch and trunk coupled to the call destination.

As a part of the translation, the SCP may transfer queries to routing processors. The routing processors process the queries to determine labels that ultimately control how the calls are routed. The routing processors transfer the labels to the SCP, and the SCP translates the labels into the routing instructions. Customers of the telecommunication

5   network may operate their own routing processors to control incoming calls. The telecommunication network may also use routing processors to internally route calls within the network.

Many calls require the use of a service platform. The service platform executes call processing scripts, typically selected based on the dialed number, that direct the

10   service platform to apply services to the call. One example of a service is a calling card service where a the service platform answers the call and prompts the caller with audio messages to enter their calling card number, a personal identification number, and a number to call. The service platform then checks the numbers and initiates the call to the desired number. Another example of a service is interactive call routing where the

15   service platform prompts the caller to enter a "1" for customer service, "2" for accounting, or a "3" for product ordering, and then the service platform directs the switching system to route the call to the destination selected by the caller.

In many cases, the destination owns and operates call systems that interact with the caller to collect information. For example, an airline may have its own service

20   platform that collects frequent flyer numbers for incoming calls, so the agent has caller information when they answer the call. In other cases, the agents themselves collect the caller information.

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To relieve the destination of this burden, the telecommunication network can use its service platform to collect caller information and transfer the caller information to the destination call system. Thus, the destination may have: 1) a routing processor that interacts with the network SCP to direct call routing, 2) a call system that interacts with

5 the network service platform to receive caller information, and 3) call agents to answer calls. Unfortunately, the destination must coordinate the call system and the routing processor if routing decisions are to be made using the caller-entered information.

Calls are often transferred from one destination to another. For example an airline may transfer a call to a car rental agency after booking a flight for the caller. After each

10 transfer, the caller may be required to re-enter the caller information. In addition, the telecommunication network must use service platform capacity to re-collect the caller information.

SUMMARY OF THE INVENTION

15 The invention helps solve the above problems with a telecommunication network that transfers caller-entered information to multiple destinations without having to re-collect the caller information for each destination. Advantageously, the destinations may make call routing and processing decisions based on the caller information, but they do not need to own and operate call systems that collect the caller information. Since the

20 telecommunication network can provide the caller information directly to the destination routing processors, the destinations do not require separate call systems to coordinate and transfer the caller information from the telecommunication network to the routing processors. Advantageously for the caller, the caller-entered information may be re-used,

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so the caller is relieved from re-entering the information for each destination. This re-use also saves call-processing resources within the telecommunication network.

Examples of the invention include a telecommunication network and a method of operation for the telecommunication network. The telecommunication network

5   comprises a switching system, a service platform, and an SCP system. The switching system routes a call to a service platform. The service platform transfers a prompt message over the call, collects caller-entered information from the caller over the call in response to the prompt message, and transfers the caller-entered information to the SCP system. The SCP system transfers the caller-entered information to a first destination

10   processor, processes a first destination routing code from the first destination processor to determine a first destination routing instruction, and transfers the first destination routing instruction to the switching system. The switching system routes the call to a first destination in response to the first destination routing instruction. The SCP system transfers the caller-entered information to a second destination processor, processes a

15   second destination routing code from the second destination processor to determine a second destination routing instruction, and transfers the second destination routing instruction to the switching system. The switching system routes the call to a second destination in response to the second destination routing instruction.

In some examples of the invention, the service platform receives a request from

20   the first destination to transfer the call to the second destination.

In some examples of the invention, the service platform does not re-collect the caller-entered information during the call.

In some examples of the invention, the first destination processor selects the first destination routing code based on the caller-entered information and the second destination processor selects the second destination routing code based on the caller-entered information.

5 In some examples of the invention, the call from the caller comprises a first call. The service platform transfers a tracking number to the SCP system with the caller-entered information, initiates a second call to the switching system and transfers the tracking number to the switching system with the second call, and connects the first call to the second call. The switching system transfers an SCP query for the second call to the

10 SCP system. The SCP system correlates the SCP query with the caller-entered information based on the tracking number and processes the SCP query to transfer the caller-entered information to the first destination processor. The switching system routes the second call to the first destination in response to the first destination routing instruction and wherein routing the first call to the first destination comprises routing the

15 second call to the first destination.

In some examples of the invention, the service platform receives a call transfer instruction from the first destination, initiates a third call to the switching system and transfers the tracking number to the switching system with the third call, and connects the first call to the third call. The switching system transfers an SCP query for the third call

20 to the SCP system. The SCP system correlates the SCP query for the third call with the caller-entered information based on the tracking number and processes the SCP query for the third call to transfer the caller-entered information to the second destination processor. The switching system routes the third call to the second destination in

response to the second destination routing instruction wherein routing the first call to the

second destination comprises routing the third call to the second destination.

In some examples of the invention, the service platform terminates the second call

after receiving the call transfer instruction.

5   In some examples of the invention, the caller-entered information comprises a

caller identification number or a caller account number.

In some examples of the invention, the SCP system transfers an ANI to the first

destination processor and the second destination processor wherein the first destination

processor selects the first destination routing code based on the ANI and the second

10   destination processor selects the second destination routing code based on the ANI.

In some examples of the invention, the first destination correlates the caller-

entered information with the call received into the first destination based on the ANI, and

the second destination correlates the caller-entered information with the call received into

the second destination based on the ANI.

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BRIEF DESCRIPTION OF THE DRAWINGS

The same reference number represents the same element on all drawings.

FIG. 1 illustrates a telecommunication network in an example of the invention.

FIG. 2 is a table that describes call and data flow for a telecommunication

20   network in an example of the invention.

FIG. 3 illustrates the operation of a telecommunication network in an example of

the invention.

FIG. 4 illustrates the operation of a telecommunication network in an example of the invention.

FIG. 5 illustrates the operation of a telecommunication network in an example of the invention.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1-5 and the following description depict specific examples to teach those skilled in the art how to make and use the best mode of the invention. For the purpose of teaching inventive principles, some conventional aspects have been simplified or omitted.

10 Those skilled in the art will appreciate variations from these examples that fall within the scope of the invention. Those skilled in the art will appreciate that the features described below can be combined in various ways to form multiple variations of the invention. As a result, the invention is not limited to the specific examples described below, but only by the claims and their equivalents.

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Telecommunication Network Configuration -- FIG. 1

FIG. 1 illustrates telecommunication network 100 in an example of the invention. Telecommunication network 100 includes switching system 101, Service Control Point (SCP) system 102, network Routing Processor (RP) 103, and service platform 104.

20 Switching system 101 is coupled to caller 150 over call path 131, to service platform 104 over call paths 132-134, to first destination call system 112 over call path 135, and to second destination call system 122 over call path 136. Call paths 131-136 may each include multiple individual call links and may include other communication systems and

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networks. SCP system 102 is coupled to switching system 101 by data path 141, to

network RP 103 by data path 142, to service platform by data path 143, to first

destination RP 111 by data path 144, and to second destination RP 121 by data path 145.

Data paths 141-145 may each include multiple individual data links and may include

5   other communication systems and networks.

Switching system 101 could include multiple interconnected telecommunication

switches. SCP system 102 could include multiple SCPs, and an SCP includes any call

processing system that responds to queries from a switching system with routing

instructions. Service platform 104 could include multiple voice response units, control

10   processors, and switches at multiple sites. Network RP 103 could include multiple

processors. In variations of the invention, the functionality of network elements 101-104

could be re-distributed from one element to another, and various ones of network

elements 101-104 could be integrated together. In addition destination RPs 111 and/or

121 could be hosted by telecommunication network 100. Based on this disclosure, those

15   skilled in the art will appreciate how to modify and combine existing telecommunication

components to configure and operate network 100. Those skilled in the art will also

appreciate that the operations of network 100 are directed by software that is stored on

various storage media.

20   Telecommunication Network Operation -- FIGS. 2-5

FIG. 2 is a table that describes call and data flow for telecommunication network

100 in an example of the invention. FIGS. 3-5 illustrate the operation of

telecommunication network 100 in an example of the invention. The numbers and

actions in the first two columns of FIG. 2 correlate to the numbers and actions of FIGS. 3-5. These actions are indicated parenthetically below.

In operation, caller 150 calls a first Dialed Number (DN #1), and switching system 101 receives the call over call path 131 (action 1). To place the call, caller 150

5   uses a telephone system that has an associated telephone number that is referred to as an Automatic Number Identification (ANI). Switching system 101 receives DN #1 and the ANI for the call. Switching system 101 processes DN #1, and possibly the ANI, to transfer a query to SCP system 102 (action 2). The query includes DN #1 and the ANI.

SCP system 102 processes DN #1, and possibly the ANI, to transfer a query to

10   network RP 103 (action 3). Network RP 103 processes DN #1, and possibly the ANI, to select a first label (LABEL #1). Labels are routing codes that control subsequent call handling. Network RP 103 transfers a response that indicates LABEL #1 to SCP system 102 (action 4). SCP system 102 processes LABEL #1 through translation tables to identify a first Switch and Trunk (SW/TNK #1) and digits for a first Dialed Number

15   Information Service (DNIS #1). Switch and trunk combinations are routing instructions for switching system 101. SCP system 102 transfers a response indicating SW/TNK #1 and DNIS #1 to switching system 101 (action 5).

Switching system 101 uses SW/TNK #1 to route the call to service platform 104 and to transfer DNIS #1 and the ANI to service platform 104 (action 6). At this point, the

20   call is established from caller 150 to service platform 104 over call path 131, switching system 101, and call path 132.

Service platform 104 processes DNIS #1, and possibly the ANI, to select and apply a call processing script. In response to the call processing script, service platform

104 transfers an audio prompt message to switching system 101 (action 7), and switching

system 101 transfers the audio prompt message to caller 150 (action 8). In response to

the prompt, caller 150 transfers caller-entered information to switching system 101

(action 9), and switching system 101 transfers the caller-entered information to service

5   platform 104 (action 10).

In some examples of the invention, the caller-entered information comprises Dual

Tone Multi-Frequency (DTMF) tones representing caller-entered digits. Some examples

of caller-entered digits include caller identification numbers and caller account numbers.

For example, the audio prompt could say, "Please enter your frequent flyer number," and

10   caller 150 would provide their frequent flyer number by pressing keys on their telephone

to transfer corresponding DTMF digits. Alternatively, service platform 104 may use

voice recognition equipment or some other system to collect the caller-entered

information over the call.

In response to the call processing script, service platform 104 generates a tracking

15   number that allows telecommunication network 100 to associate data with the call. The

tracking number could include an SCP ID, SCP processor ID, and a unique number. In

response to the call processing script, service platform 104 initiates a second call to

switching system 101 using a second Dialed Number (DN #2) and indicating the tracking

number as the ANI (action 11A). Service platform 104 connects the first call to the

20   second call. DN #2 is indicated in the call processing script and is typically different that

DN #1. Advantageously, a destination may have multiple DN #1's that all use a single

DN #2 to reach the destination. In response to the call processing script, service platform

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104 also transfers the ANI, tracking number, and caller-entered information to SCP system 102 (action 11B).

Switching system 101 processes DN #2 to transfer a query to SCP system 102 (action 12). The query includes DN #2 and the tracking number as the ANI. SCP system

5   102 uses the tracking number to correlate the ANI and the caller-entered information collected by service platform 104 with the second query from switching system 101. SCP system 102 processes DN #2 to transfer a query to destination RP 111 (action 13). This query includes the ANI and the caller-entered information.

Destination RP 111 processes the ANI and the caller-entered information to select

10   a second label (LABEL #2) that will control subsequent call handling. Advantageously, first destination 110 may use the caller-entered information to route the call to a selected call destination. For example, first destination 110 may desire to route privileged customers having special account numbers to higher-quality telephone agents having shorter call queues. Advantageously, first destination 110 uses telecommunication

15   network 100 to collect the caller-entered information, and thus, first destination 110 does not require additional equipment or operator time to collect the information. Destination RP 111 transfers a response that indicates LABEL #2 to SCP system 102 (action 14).

SCP system 102 processes LABEL #2 through translation tables to identify a second Switch and Trunk (SW/TNK #2) and digits for a second Dialed Number

20   Information Service (DNIS #2). SCP system 102 transfers a response indicating SW/TNK #2 and DNIS #2 to switching system 101 (action 15). Switching system 101 uses SW/TNK #2 to route the call to destination call system 112 and to transfer DNIS #2 and the ANI destination call system 112 (action 16). In some examples, the ANI is

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transferred in a "charge to" field. At this point, the call is established from caller 150 to

destination call system 112 over call path 131, switching system 101, call path 132,

service platform 104, call path 133, switching system 101, and call path 135.

Destination call system 112 handles the call. In some examples, destination 110

5   correlates the call with the caller-entered information based on the ANI. In some

examples of the invention, destination 110 may desire to transfer the call. For example,

after booking a flight, an airline may desire to transfer the call to a car rental agency.

Destination call system 112 initiates the call transfer by transferring DTMF digits, such

as "*8", to switching system 101 (action 17). Switching system 101 transfers the DTMF

10   digits to service platform 104 (action 18).

In response to the DTMF digits that indicate call transfer, service platform 104

transfers a dial tone to switching system 101 (action 19), and switching system 101

transfers the dial tone to destination call system 112 (action 20). In response to the dial

tone, destination call system 112 transfers a third Dialed Number (DN #3) to switching

15   system 101 (action 21), and switching system 101 transfers DN #3 to service platform

104 (action 22). DN #3 could be a transfer code or speed-dial number.

At this point, service platform 104 and switching system 101 drop the portion of

the call over call paths 133 and 135 from service platform 104 to destination call system

112. Thus, the call is still established from caller 150 to service platform 104 over call

20   path 131, switching system 101, and call path 132.

In response to DN #3, service platform 104 initiates a third call to switching

system 101 using DN #3 and indicating the tracking number as the ANI (action 23).

Service platform 104 connects the first call to the third call. Switching system 101

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processes DN #3 to transfer a query to SCP system 102 (action 24). The query includes

DN #3 and the tracking number as the ANI. SCP system 102 uses the tracking number to

correlate the ANI and the caller-entered information collected by service platform 104

with the third query from switching system 101. SCP system 102 processes DN #3 to

5   transfer a query to destination RP 121 (action 25). This query includes the ANI and the

caller-entered information.

Destination RP 121 processes the ANI and the caller-entered information to select

a third label (LABEL #3) that will control subsequent call handling. Advantageously,

second destination 120 may also use the caller-entered information to route the call to a

10   selected call destination. Advantageously, second destination 120 uses

telecommunication network 100 to collect the caller-entered information, and thus,

second destination 120 does not require additional equipment or operator time to collect

the information. Advantageously for telecommunication network 100 and caller 150, the

previously collected caller-entered information may be re-used without re-collection.

15   Destination RP 121 transfers a response that indicates LABEL #3 to SCP system 102

(action 26).

SCP system 102 processes LABEL #3 through translation tables to identify a third

Switch and Trunk (SW/TNK #3) and digits for a third Dialed Number Information

Service (DNIS #3). SCP system 102 transfers a response indicating SW/TNK #3 and

20   DNIS #3 to switching system 101 (action 27). Switching system 101 uses SW/TNK #3

to route the call to destination call system 122 and to transfer DNIS #3 and the ANI

destination call system 122 (action 28). At this point, the call is established from caller

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150 to destination call system 122 over call path 131, switching system 101, call path 132, service platform 104, call path 134, switching system 101, and call path 136.

Destination call system 122 handles the call. In some examples, second destination 120 correlates the call with the caller-entered information based on the ANI.

5   In some examples of the invention, second destination 120 may desire to transfer the call to a third destination. This call transfer is handled as described above. Thus, multiple call transfers can be implemented. Advantageously, each destination may base routing decisions and call processing based on caller-entered information without collecting the caller-entered information. Advantageously, caller 150 only places one call and enters

10   their information one time, and then caller 150 receives special call handling and services from multiple call destinations.

In some examples of the invention, switching system 101 may remove service platform 104 from the call. For example, on the call to destination 120, switching system 101 could remove call paths 132 and 134 and directly connect call paths 131 and 136. In

15   these examples, call transfer functionality would need to be moved to switching system 101, or else it would be eliminated when service platform 104 is removed from the call.

In some examples of the invention, SCP system 102 retains the caller-entered information for a time period, such as two hours. If desired, this caller -entered information could be re-used on calls to the same DN and from the same ANI.

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CLAIMS: